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EXAMINER	
BREVAL, ELMITO	
ART UNIT	PAPER NUMBER
2889	

MAIL DATE	DELIVERY MODE
01/28/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/530,149	BOERNER ET AL.	
	Examiner	Art Unit	
	ELMITO BREVAL	2889	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 January 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 01/12/2010 has been entered.

Response to Arguments

Applicant's arguments filed 01/12/2010 have been fully considered but they are not persuasive. The applicant has made one argument: (1) Shimizu's reference (US. Pat: 5,003,221) does not teach the limitation "a stack of 2n +1 transparent dielectric layers wherein n= 2, 3,..., said transparent dielectric layers having a high refractive index of n> 1.7 or a low refractive index of n<= 1.7, and said transparent dielectric layers having a high refractive index n being arranged in alternating manner with said transparent dielectric layers having a low refractive index."

In response to the applicant argument: the examiner agrees that Shimizu does not expressly teach a stack of 2n + 1 transparent dielectric layers, wherein n= 2, 3, ... (i.e. a stack of 5 layers or greater). However, Shimizu (in at least fig. 5; examples 4-1 and 4-2) teaches a stack of 4 transparent dielectric layers with different refractive index arranged in alternative manner. Further, Shimizu (in col. 14, lines 28-29) teaches "in some cases, the dielectric layers may have a multilayered structure." For instance, if

one of the four dielectric layers of Shimizu has a multilayer structure, the stack will be 5 layers or greater as claimed by the applicant.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The applicant claimed "the stack of transparent dielectric layers having a high refractive index of n > 1.7 **or** a low refractive index of n<= 1.7, and said transparent dielectric layers having a high refractive index n being arranged in alternating manner with said transparent dielectric layers having a low refractive index n." It is unclear to the examiner how the stack of the transparent dielectric layers can be either high or low and at same time be high and low and arranged in alternating manners. For purpose of examination the examiner interprets the claimed limitation as the following:" the stack of transparent dielectric layers having a high refractive index of n > 1.7 **and** a low refractive index of n<= 1.7, and said transparent dielectric layers having a high refractive index n being arranged in alternating manner with said transparent dielectric layers having a low refractive index n."

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3, 5, 6, 8-9, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu (US. Pub: 5,003,221) of record in view of Jones et al., (WO 00/12226) of record.

Regarding claim 1, Shimizu ('221) teaches (in at least fig. 5; col. 10, line 56 through col. 11, line 61; examples 4-1 and 4-2) an electroluminescent display comprising a transparent substrate (31; i.e. the common substrate), wherein the electroluminescent device comprise a luminescent layer (35) which is sandwiched between a plurality of stripe transparent electrodes (33; i.e. first electrode) and a plurality of stripe back electrode (37; i.e. second electrode), a stack of four transparent dielectric layers (34, 32, 320, 36) said transparent dielectric layers having a high refractive index of n > 1.7 and a low refractive index of n<= 1. 7, and said transparent dielectric layers having a high refractive index n (34, 36) being arranged in alternating manner with said transparent dielectric layers having a low refractive index n (i.e. 32, 320), said stack transparent dielectric layers being arranged adjacent to one of the electrodes (33, 37) and including a dielectric transparent layer (34 made of Y2O3) having a high refractive index n adjoining the transparent electrode (33). In col. 14, lines 28-29), Shimizu ('221) teaches in some cases, the dielectric layers may have a multilayered structure (i.e. 2n+ 1 for n= 2, 3, or a stack of 5 layers or greater).

Further regarding claim 1, Jones ('226) teaches an electroluminescent device comprised of, in part, a color converting material (32) capable of changing the color of

light produced by the device (see page 7, lines 2-3) in order to have a device that can emit light of different color.

Hence, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the color converting layer of Jones in the device of Shimizu in order to have a device that can emit light of different color.

Regarding claim 2, Shimizu ('221) teaches (in col. 4, lines 49-64) the thin film layer (12) can be selected from TiO2.

Regarding claim 3, Shimizu ('221) teaches (in col. 4, lines 49-63) the thin film layer (12) can be selected from SiO2.

Regarding claim 5, Jones ('226) teaches (in at least fig. 1 and corresponding paragraphs) the electroluminescent device is an active matrix device having a pixilated first electrode (12). The reason for combining is the same as for claim 1.

Regarding claim 6, Jones ('226) teaches (in at least fig. 1) a capping layer (15) is placed adjacent to the second electrode (14) and wherein the color converter material is placed on top of the capping layer (15; i.e. the protective layer).

Regarding claim 8, Shimizu ('221) teaches (in at least fig. 5; col. 10, line 56 through col. 11, line 61; examples 4-1 and 4-2) an electroluminescent display comprising a transparent substrate (31; i.e. the common substrate), wherein the electroluminescent device comprise a luminescent layer (35) which is sandwiched between a plurality of stripe transparent electrodes (33; i.e. first electrode) and a plurality of stripe back electrode (37; i.e. second electrode), a stack of four transparent dielectric layers (34, 32, 320, 36) said transparent dielectric layers having a high

refractive index of n > 1.7 and a low refractive index of n<= 1. 7, and said transparent dielectric layers having a high refractive index n (34, 36) being arranged in alternating manner with said transparent dielectric layers having a low refractive index n (i.e. 32, 320), said stack transparent dielectric layers being arranged adjacent to one of the electrodes (33, 37) and including a dielectric transparent layer (34 made of Y2O3) having a high refractive index n adjoining the transparent electrode (33). In col. 14, lines 28-29), Shimuzu ('221) teaches in some cases, the dielectric layers may have a multilayered structure (i.e. 2n+ 1 for n= 2, 3... or a stack of 5 or greater).

However, Shimizu ('221) does not teach a color converting material which is capable of changing light emitted by the electroluminescent layer into light having a longer wavelength.

Further regarding claim 8, Jones ('226) teaches an electroluminescent device comprised of, in part, a color converting material (32) capable of changing the color of light produced by the device (see page 7, lines 2-3) in order to have a device that can emit light of different color.

Hence, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the color converting layer of Jones in the device of Shimizu in order to have a device that can emit light of different color.

Regarding claim 9, Jones ('226) teaches (in page 6, lines 2-3) the color converting material is configured to convert blue light to at least one of red and green light. The reason for combining is the same as for claim 8.

Regarding claim 12, Jones ('226) teaches (in page 6, lines 2-3) the color converting material is configured to convert blue light to at least one of red and green light. The reason for combining is the same as for claim 8.

Claims 15, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimuzu (US. Pub: 5,003,221) of record.

Regarding claim 15, Shimizu ('221) teaches (in at least fig. 5; col. 10, line 56 through col. 11, line 61; examples 4-1 and 4-2) an electroluminescent display comprising a transparent substrate (31; i.e. the common substrate), wherein the electroluminescent device comprise a luminescent layer (35) which is sandwiched between a plurality of stripe transparent electrodes (33; i.e. first electrode) and a plurality of stripe back electrode (37; i.e. second electrode), a stack of four transparent dielectric layers (34, 32, 320, 36) said transparent dielectric layers having a high refractive index of n > 1.7 and a low refractive index of n<= 1. 7, and said transparent dielectric layers having a high refractive index n (34, 36) being arranged in alternating manner with said transparent dielectric layers having a low refractive index n (i.e. 32, 320), said stack transparent dielectric layers being arranged adjacent to one of the electrodes (33, 37) and including a dielectric transparent layer (34 made of Y2O3) having a high refractive index n adjoining the transparent electrode (33).

However, Shimizu ('221) does not expressly teach a stack of 2n +1 transparent dielectric for n=2, 3, ...; however, in col. 14, lines 28-29, in some cases, the dielectric layers may have a multilayered structure. For, instance, if one of the dielectric layers in fig. 5 is a multilayer, the stack will have at least five layers or more. One of ordinary skill

in the art would easily contemplate of making the multilayered structure of Shimuzu as 2n +1 for n= 2, 3, ..) for the purpose of improving the luminance efficiency of the device.

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to contemplate of forming the stack of 2n + 1 transparent dielectric layers for n= 2, 3…; for the purpose of improving the luminance efficiency of the device.

Regarding claim 17, Shimizu ('221) teaches (in col. 4, lines 49-64) the thin film layer (12) can be selected from TiO2.

Regarding claim 18, Shimizu ('221) teaches (in col. 4, lines 49-63) the thin film layer (12) can be selected from SiO2.

Claims 16 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu (US. Pub: 5,003,221) of record in view of Jones et al., (WO 00/12226) of record.

Regarding claim 16, Shimizu ('221) teaches all the claimed limitations except for a color converting material which is capable of changing the light emitted by the electroluminescent layer into a light having a different wavelength.

Further regarding claim 16, Jones ('226) in the same field of endeavor teaches an electroluminescent device comprised of, in part, a color converting layer (32) capable of changing the color of light produced by the OLED (see page 7, lines 2-3) in order to have a device that can emit light of different color.

Hence, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the color converting layer of Jones in the device of Shimizu in order to have a device that can emit light of different color.

Regarding claim 20, Jones ('226) teaches (in at least fig. 1; abstract) a color converting material (16) which is capable of changing the light emitted by the electroluminescent layer into a light having a different wavelength; and a protective layer (15; i.e. the capping layer) placed adjacent to the electrode (14; i.e. the second electrode) wherein the color converter material is placed on top of the protective layer (15). The reason for combining is the same as for claim 16.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu (US. Pat: 5,003,221) of record by the applicant in view of Jones et al., (WO 00/12226) of record by the applicant in further view of Leising et al., (US. Pat: 6,117,529) of record by the examiner.

Regarding claim 4, Shimizu/Jones teach all the claimed limitations except for the transparent dielectric layers having a low refractive index is MgF2.

Further regarding claim 4, Leising ('529) in the same field of endeavor teaches an organic electroluminescent device comprised of, in part, a low refractive transparent dielectric layer made of MgF2 (col. 5, line 64) for the purpose of improving the luminance efficiency of the device.

Hence, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the dielectric material of Leising into the device of Shimizu/Jones for the purpose of improving the luminance efficiency of the device.

Claim 10, 11, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu (US. Pat: 5, 003, 221) of record by the examiner in view of Jones et al., (WO 00/12226) of record by the applicant in further view of Tang et al., (US. Pat: 5,294,870) of record by the examiner.

Regarding claims 10 and 13, Shimizu/Jones teach all the claimed limitations except for the blue light passes through the electroluminescent device substantially without loss.

Further regarding claim 10, Tang ('870) teaches an electroluminescent lamp comprised of, in part, a blue color converting material wherein the blue light passes through the electroluminescent device substantially without loss (col. 8, lines 54-56) for the purpose of emitting a blue light without any shift in color.

Hence, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the blue light converting material of Tang into the device of Shimizu/Jones for the purpose of emitting a blue light without any shift in color.

Regarding claims 11 and 14, Shimizu/Jones teach all the claimed limitations except for the color converting material is configured to convert blue light to red light for a first sub-pixel, and to convert the blue light to green light for a second sub-pixel, and wherein the blue light passes through the electroluminescent device substantially without loss for a third sub-pixel.

Further regarding claims 11 and 14, Tang ('870) teaches an electroluminescent device comprised of, in part, a color converting material wherein the color converting

material is configured to convert blue light to red light for a first sub-pixel, and to convert the blue light to green light for a second sub-pixel, and wherein the blue light passes through the electroluminescent device substantially without loss for a third sub-pixel (col. 8, lines 8-68) for the purpose of having good luminance efficiency of the device.

Hence, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the color converting material as taught by Tang into the device of Shimizu/Jones for the purpose of improving the luminance efficiency of the device.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu (US. Pat: 5,003,221) of record by the applicant in view of Leising et al., (US. Pat: 6,117,529) of record by the examiner.

Regarding claim 19, Shimizu teaches all the claimed limitations except for the transparent dielectric layers having a low refractive index is MgF2.

Further regarding claim 19, Leising ('529) in the same field of endeavor teaches an organic electroluminescent device comprised of, in part, a low refractive transparent dielectric layer made of MgF2 (col. 5, line 64) for the purpose of improving the luminance efficiency of the device.

Hence, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the dielectric material of Leising into the device of Shimizu for the purpose of improving the luminance efficiency of the device.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu (US. Pat: 5,003,221) of record by the applicant in view of Jones et al., (WO 00/12226) of record by the applicant in further view of Trottier et al, (US. Pub: 2004/0061124).

Regarding claim 7, Shimizu/Jones teach all the claimed limitations except for the converting material is selected from the group consisting of (Ba, Sr)2 SiO4:Eu, SrGa2S4:Eu, CaS:Ce, Ba2ZnS3: Ce, K, Lumogen yellow ED206, (Sr, Ca)2SiO4:Eu, (Y,Gd) 3(Al, Ga)5O12:Ce, Y3AL5O12:Ce, Lumogen F orange 240, SrGa2S4: Pb, Sr2Si5N8: Eu, SrS:Eu, Lumogen F red 300, Ba2Si5N8:Eu, Ca2Si5N8:Eu, CaSiN2:Eu and CaS:Eu.

Further regarding claim 7, Trottier ('124) teaches a light emitting device comprised of, in part, a wavelength converting material selected from SrS: Eu ([0017]) for the purpose of having a device capable of emitting light of different wavelengths.

Hence, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the wavelength converting material of Trottier in the device of Shimizu/Jones for the purpose of having a device capable of emitting light of different wavelength.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ELMITO BREVAL whose telephone number is (571)270-3099. The examiner can normally be reached on M-F (8:30 AM-5:00 Pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Toan Ton can be reached on (571)-272-2303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

January 22, 2010
/Elmito Breval/
Examiner, Art Unit 2889

/Bumsuk Won/
Primary Examiner, Art Unit 2889